

Beck to the Future: time to leave it alone

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Abstract

When one thinks of a map depicting London, generally the image that appears is of that of the map designed by Beck. It has become a design icon. Beck's map, designed in 1933, and first made available to London commuters in 1933, has become the image of the geography of London and, generally, the mental map that defines how London 'works'.

As a communication tool, Beck's map does work. It is an effective communicator of the London Underground train network and the distribution of stations and connections between one line and others. Whilst it is acknowledged that the geography of London is distorted, it still retains the status of 'the' map of London.

The paper asserts that Beck's map is over-used. It has suffered years of abuse and that has diluted its own place in cartographic history.

The first component of the paper begins by providing a brief background of Beck and his London Underground map. This is followed by an outline of the three principle ways in which Beck's ideas have been used. It then considers if, as previously stated, this map is a design icon or classic design. This is followed by a review of the attributes that appear to make it cartographically functional. Once these elements have been established the paper further reviews how, even if the geography is depicted in a way that distorts the true geography of London, users really don't care, and they consume the map as a tool for moving about London, underground.

The second component of the paper addresses the use and mis-use of Beck's design. As stated at the beginning of this abstract, we consider that Beck's map is over-used, especially by those who mimic and transform Beck's design and call it their own 'new' design. Through these mechanizations and manipulations of the 'pure' elements of Beck's design by others, it has suffered years of abuse and that has diluted its own place in cartography and design.

The final component of the paper reports on an online survey that was conducted to gauge the success of Beck-esque maps and diagrams. The results of the analysis of this survey, and the consideration of whether these contemporary 'new' designs, when compared to Beck's design do provide a better representation of the London Underground and thus a better planning and navigation tool.

Key words: cartographic design, metro maps

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Introduction: Beck's London Underground map

Prior to 1932, maps provided by London Transport clung closely to the geography above ground, irrespective of the fact that the system being represented was a different geography altogether. In 1931, Electrical Draughtsman, Harry Beck designed a completely new map of the Underground, which ignored the geography aboveground and concentrated on ‘mapping’ the lines, stations and interchanges. His map was tested by The London Passenger Transport Board (now Transport for London (TfL)) in 1932, with a trial print run and the first map was published and made available to the public in 1933. It was an immediate success! The public loved it! By distorting geography Beck made the map more usable and an effective communicator about how to move about (under) London.



Figure 1. Beck's map – first edition, 1933.

Source:<http://www.ltmuseum.co.uk/omnibus/pg/1919b.htm#>

Previous maps had been tied to the geography of London above ground. Their designs slavishly sought to ensure that everything was ‘geographically correct’. This impacted on the final product.

Depicting London's Underground pre-Beck

Several diagrams of the system were used, especially inside carriages. They generally showed one particular line, rather than the whole system. Figure 2 illustrates one of the diagrams employed.



Figure 2. District Railway Route Diagram (1920s). Source: London Transport Museum collection, <http://www.ltmcollection.org/images/best/eu/i00008eu.jpg>

Previous maps of the Underground were tied to the geography of London above ground. Previous designs, discussed later in this paper, slavishly sought to ensure that everything was ‘geographically correct’. This impacted on the final product.

The depiction of the central London elements of the Underground resulted in extremely crowded graphics, whereas the lines at the outer extents of the Underground system appeared as sparse, relatively empty spaces. These maps acknowledged the geographical reality above ground, but, in so doing, compromised the graphic effectiveness of the representation as a usable tool for planning and navigation. This can be seen in an early map of the system from 1874 (Figure 3), and the 1927 London Underground Map by F.H. Stingemore (Figure 4), which Beck’s map replaced.

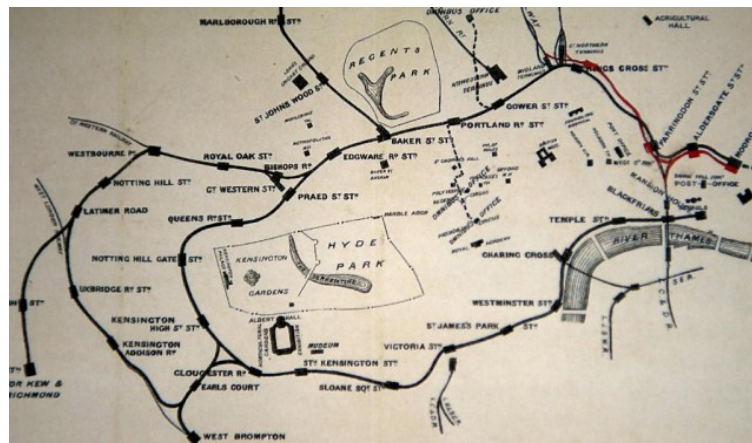


Figure 3. London Transport 1874
<http://blog.visualmotive.com/2009/automatic-generation-of-transit-maps/>

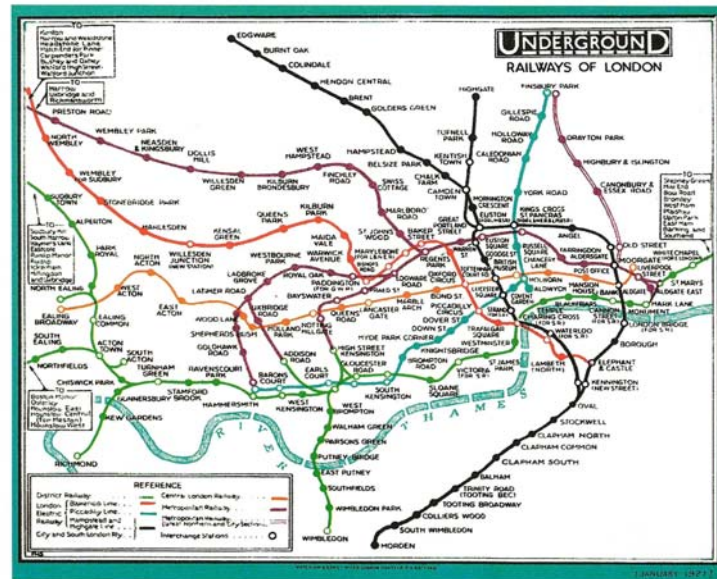


Figure 4. 1927 London Underground Map by F.H. Stingemore. Used prior to Beck's representation. London Transport Museum. Source: <http://alistairwelch.files.wordpress.com/2012/07/1984-51-208-pocket-central-london-railway-map-1907.jpg>

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When the first printed version of Beck's map was introduced by The London Passenger Transport Board in 1933 it was an outstanding success, with 850,000 copies of the map in circulation within two months after its introduction (Garland, 1994). This success is seen by Eliman (2006, p. 172) to be due to the fact that: "Beck's London Underground map offered an image of organisational clarity, brilliantly presenting the increasingly chaotic city as an object of coherence". Beck's map sat immediately within the maps of the machine aesthetic.

Beck's design principles

Beck's London Underground map changed forever how representations of urban underground railway systems were presented. Beck's training as an electrical draughtsman is obvious when one looks at his conceptual drawing for the map (Figure 5), which was then transformed into his final design for the map (Figure 6).

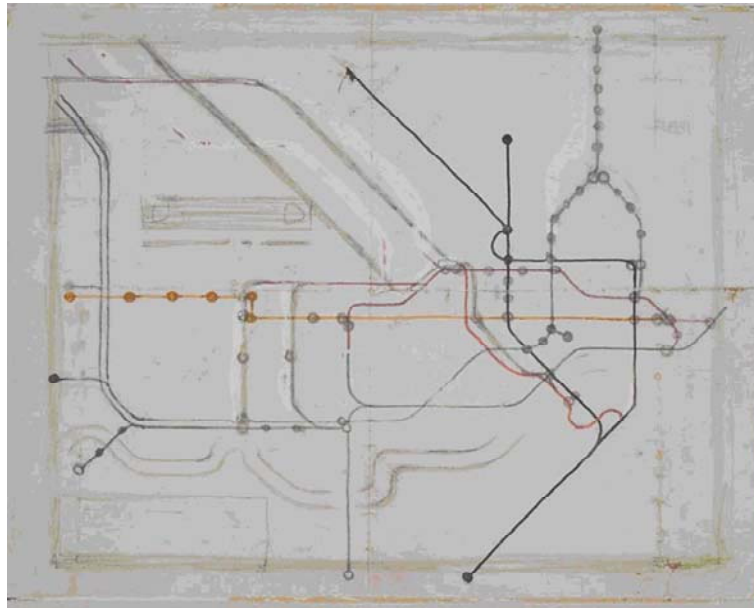


Figure 5. Sketch for London Underground map Henry C. (Harry) Beck (1903-74), 1931. Pencil and coloured ink. Science Museum, London.



Figure 6. Sketch for London Underground map. Henry C. (Harry) Beck (1903-74), 1931. Pencil & coloured ink.

Beck's representation 'painted' a fictional geography by moving away from the concept that transportation maps had to position the underground geography directly to the aboveground geography. His design moved away from the concept that the representation had to follow the actual geographical route of the lines. By replacing the strict geographically imposed rules, that required that representations be placed exactly where they were located, with a regular pattern of generally horizontal, vertical or diagonal lines his new map depicted more clearly the relative locations of the different lines and the sequence of stations. Beck's fictional underground geography did bear a close resemblance to the real geography

aboveground, but Beck sought freedom from the strict geographically imposed demands that required that elements depicted on a transportation map be placed in their exact spatial positions. Again, Beck focussed on the lines, stations and interchanges, rather than precise geographical locations.

His design had certain rules imposed:

- Only horizontal, vertical or 45° lines
- Centre of map enlarged - at expense of suburbs
- Distinctive interchange symbol
- Stations denoted by 'tickmarks'
- Distinctive colours for lines
- Street detail not shown (Roberts, 2005)

This was done to overcome several difficulties, viz:

- Dense stations in central areas
- Circle line (not circular)
- The need for diagonals
- No clear interchange convention
- The need to incorporate additional lines (Roberts, 2005)

By distorting geography Beck, made the map more usable and an effective communicator about how to move about London. His original design moved away from the concept that the map had to follow the actual geographical route of the lines. According to Hadlaw (2003), what Beck did was to set aside geographic space in favour of graphic space. (See Jenny, 2006 and Jenny and Hurni, 2011 for an investigation of the actual distortions.)

In March 2006, viewers of BBC2's The Culture Show and visitors to London's Design Museum voted Harry Beck's Tube map as their second-favourite British design of the 20th century in the Great British Design Quest. The winner was the Concorde aircraft.

(Wikipedia http://en.wikipedia.org/wiki/Harry_Beck)

Why does it work?

Hadlaw (2003) says that the actual success of the map lies in the fact that both the map and the underground users shared the same sensibility, and it was comprehensive because of the logic that underpinned the design, which was “coherent with their experience, as modern individuals, of a historically particular time and space (Hadlaw, 2003, p. 26). Here, neither good map design nor an intimate knowledge of the ‘place’ of the underground was responsible for better understanding of how the map ‘worked’, but an ‘agreement’ about the underpinning logic.

Tufte (2002) noted: “The Underground Map ... perfectly attuned to their particular data, so focused on their data sets. They do not serve, then, as good practical generic architectures for design; indeed, revisions and knock-offs have usually been corruptions or parodies of the originals.”

What were critical to Beck's design were connections: the interchanges between the various lines. His concept was to ignore what was above ground (it didn't matter when you were in

the ‘Tube’ and travelling from, say, Piccadilly to Cockfosters on the Piccadilly line) – it was the connections that mattered (Ken Garland, interview, *BBC Design Classics*, 1985).

And, any other representation of London can look, well, just wrong. As Board (Barber and Board, 1993, p. 151) notes: “*Indeed it has virtually replaced the true-to-scale maps, which can be found in most Underground stations, as the correct map because the latter look unfamiliar and therefore suspect, even wrong.*”

Mis-use of Beck’s design

Beck’s representation of the London Underground has been used as the model for developing many other representations of urban transportation systems worldwide. These representations ‘work’ in their various forms. They support gaining an understanding of the complexities of a system, aid travel planning and act as a navigation tool to assist in working one’s way through the underground maze of lines and stations and as a reference once a journey is underway.

Three principle ways in which Beck’s ideas have been used:

- by TfL who have used the basic design since its inception (not always successfully). The ideas behind Beck’s map live on in the current design but, of course, the network has grown immeasurably since 1931 and there is certainly some question as to whether Beck would have approached today’s system with the same design. (The map in figure 7 shows proposed changes to the Network proposed for 2016. Many new lines are proposed, but the elements of Beck’s design remain unchanged.)

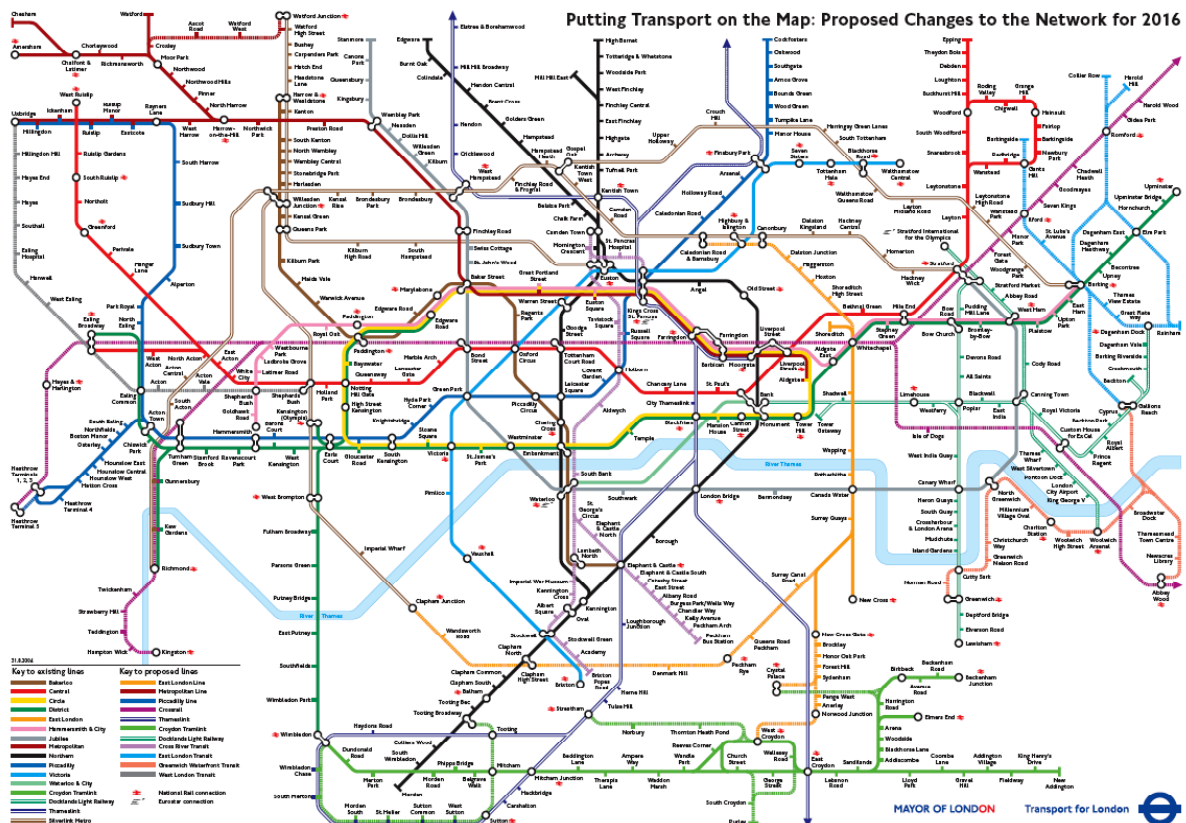


Figure 7. Proposed changes to the nNetwork for 2016. TfL.

<http://london-underground.blogspot.com/>

- as a basis for other metro mapping (both successfully and unsuccessfully) e.g. George Salomon's New York City Transit Authority (NYCTA) map, 1958 plus many others).

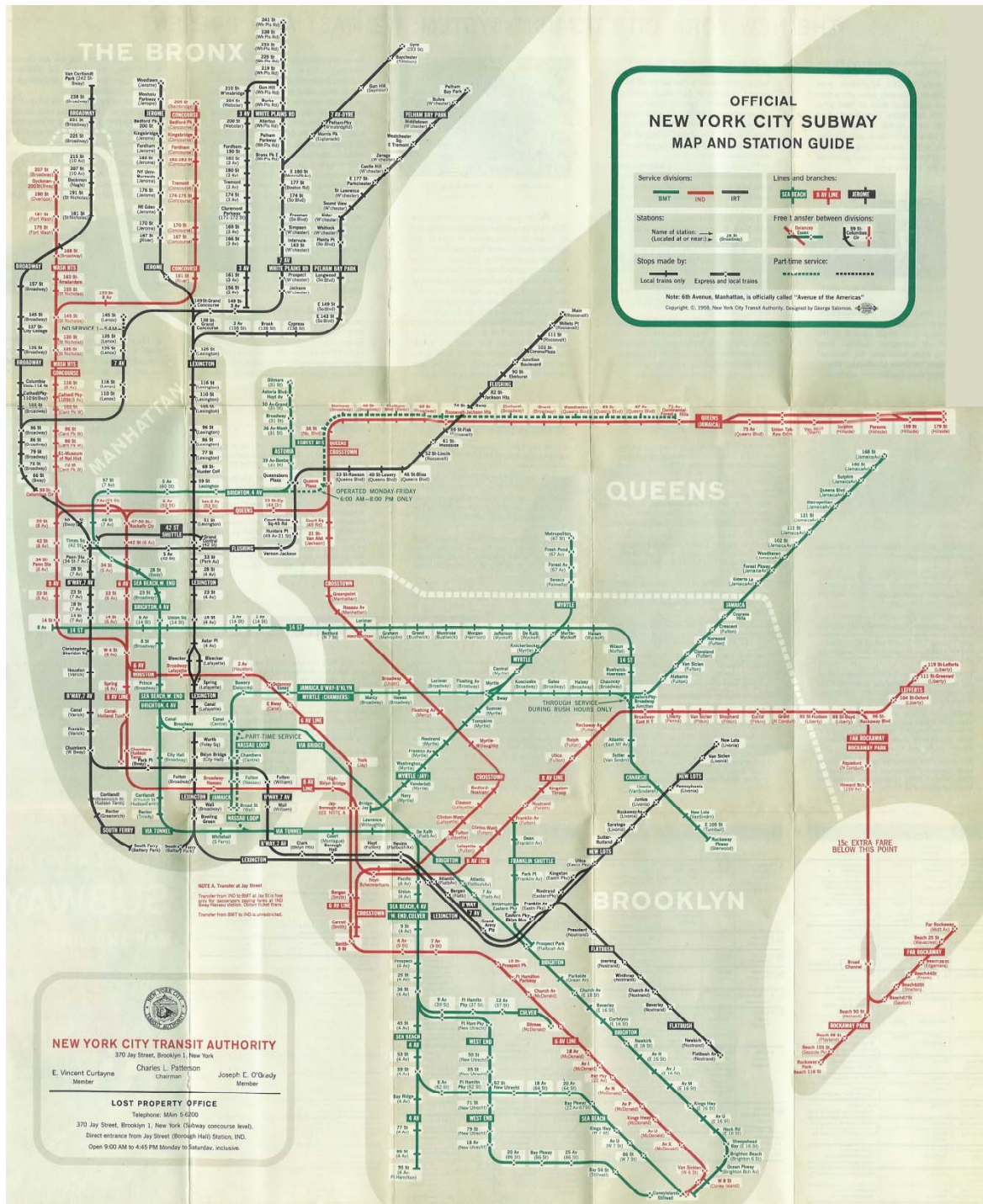


Figure 8. George Salomon, New York City Transit Authority (NYCTA) map, 1958

<http://www.aiga.org/the-mostly-true-story-of-helvetica-and-the-new-york-city-subway/>

Most other major cities with metros use a modified version of Beck's ideas. Some work very well and have spawned good maps in their own right. Others experiment (e.g. with

different angles of line) and some just fail due to poor application of the technique or an ill-fitting approach to their own specific network.

- as a template for mimics/alternatives. Beck's map seems to have become a model for parody. It is so iconic and widely known that it immediately generates interest when others base their own work on the same design ideas. Is this imitation the sincerest form of flattery? Or are people trying to gain a head start in trying to get their own work recognised?

The examples below show how others have 'just' taken Beck's design and re-generated a different version.

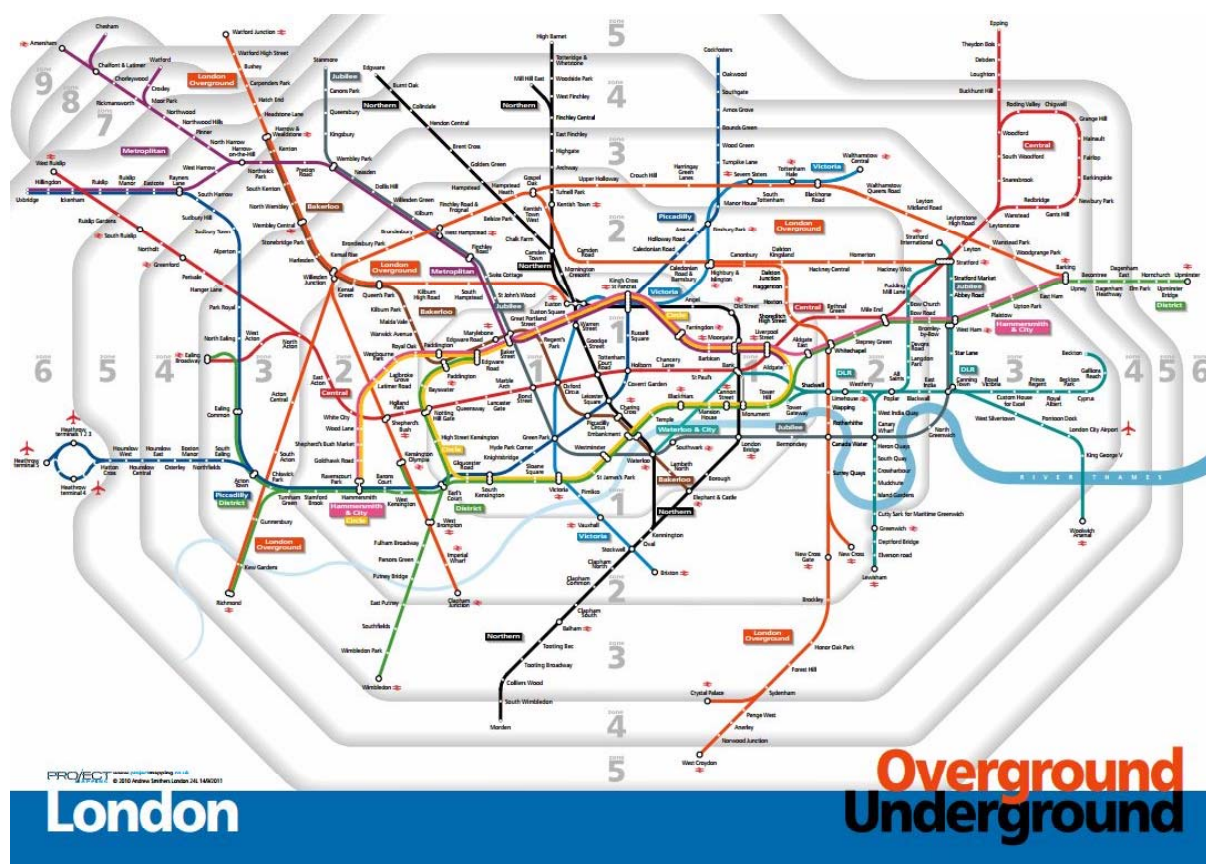


Figure 9. Andrew Smithers

<http://www.projectmapping.co.uk/Reviews/Resources/LU%20extract%20v2.5%20London%202024L.pdf>

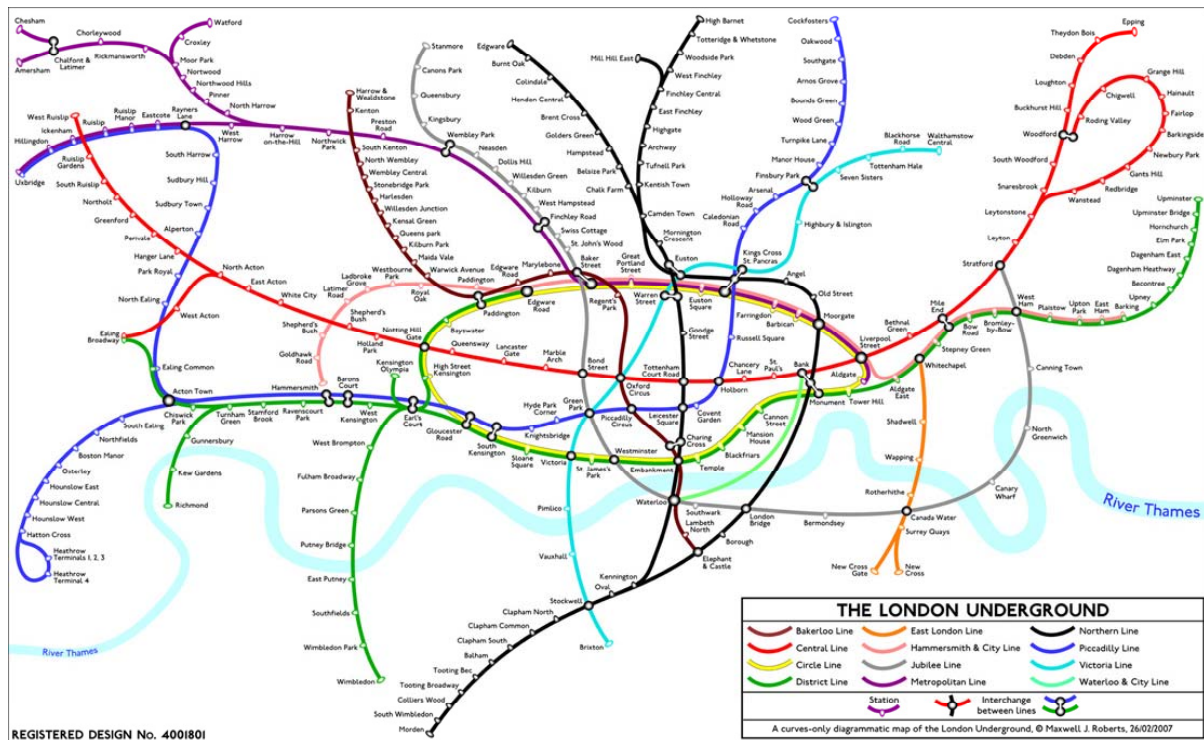


Figure 10. Maxwell Roberts - Curvy Tube Map, 2007

"A lot of people (not particularly map geeks) say that it is inviting and fun to look at."

<http://london-underground.blogspot.com.au/2007/06/curvy-tube-map.html>

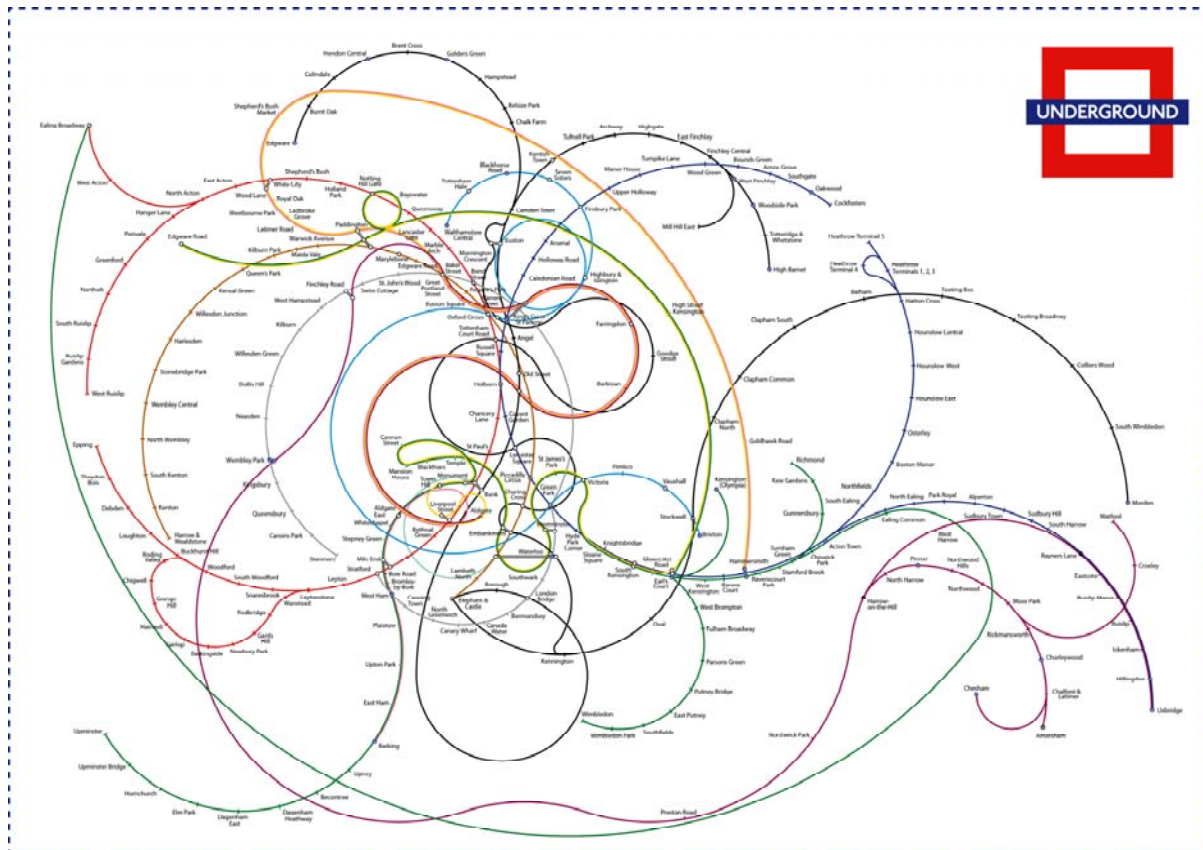


Figure 11. Francisco Dans

<http://www.flickr.com/photos/fdansv/6099930985/sizes/o/in/photostream/>



Figure 12. Mark Noad
 Changed Beck's design "to be more geographically accurate and easier to read on mobile devices"
<http://londontubemap.com/>

Mark Noad is perhaps the most prolific producer of alternative London Underground maps. He said about the current iteration of Beck's design to be:

"... confusing, especially when trying to relate it to London at Street level."

"... its just as likely to be viewed on screen as it is in print."

(Mellonie, 2011)

About his product Noad said:

"I do not claim that the map I have created is better than the original and it is not intended as a replacement," ... "Harry Beck's original is one of the greatest designs of the 20th century but, although the current diagram still follows the same principles, they have not been applied with any great care. As a result, I do not believe Beck would have been happy to put his name to the current version" (Pavlus, 2011).

But, Noad does really stick to some of Beck's ideas: the extremities of some lines are moved inwards to concentrate the map and 'standard' angles are used – here 30° and 60°.

Moving it on: use and mis-use of Beck

Beck's ideas were themselves based on linear network diagrams being developed for railway mapping. Therefore, it can be assumed that Beck did use other, existing, designs to inform and influence his own design.

It can be noted that, according to Ovenden (2005), Beck was not the first to draw this kind of display. The first was the Berlin S Bahn representation of 1931 (shown in Figure 13). However, Beck's sketch design was also produced in the same year. And, with international travel being quite rare in this period for someone like Beck, one could assume that Beck had never seen this representation.

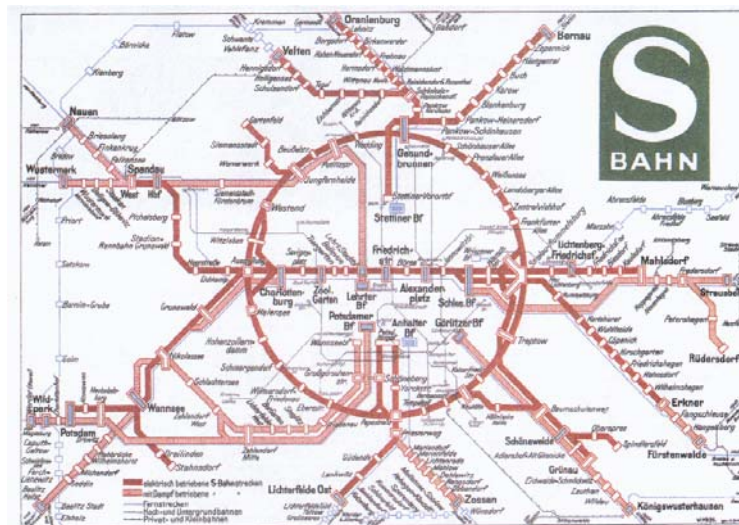


Figure 13. The Berlin S Bahn representation, 1931.

Source: http://www.schmalspurbahn.de/netze/Netz_1931_klein.gif

What are investigating is:

- Why do people use it as a basis - recognition; simplicity; vehicle?
- Post-Beck examples ... Beck's own work to experiment with alternatives as well as examples of TfL modifications and the many ways in which it has been copied.
- In-house attempts after Beck.
- Reinvention by designers ... is this because they can (software) or because it needs it?
- Interactive versions for transport planning ... cartogram morphing.
- How they (designers) are trying things out by pushing and pulling Beck's design.

Conclusion

Our assertion here is that Beck's map is over-used. It has suffered years of abuse and that has diluted its own place in cartographic history. It is a great map, a design icon and a leading light for the cartography of transport networks and journey planning.

This paper has, briefly, provided information about Beck's contributions to the current London Underground map. It has outlined the reasons why Beck's design works. And, it has

shown a few (of the many) designs that have developed new designs for representing the London Underground – both official TfL and independent designs.

But...we say “let’s move on, let’s find new ideas and generate new work rather than constantly framing our own work in the style of Beck”.

References

- Barber, P. and Board, C., 1993, *Tales from the Map Room*, London: BBC Books.
- BBC, 1985, Design Classics – *The London Underground Map*.
- Pavlus, J., 2011, *The London Tube Map, Redesigned For A Multiscreen World*, Co.DESIGN, <http://www.fastcodesign.com/1664662/the-london-tube-map-redesigned-for-a-multiscreen-world>. Web page accessed May 1 2013.
- Elliman, P., 2006, “Signal Failure”, in *Else/Where Mapping*, J. Abrams and P. Hall (eds.), Minneapolis: University of Minnesota Design Institute.
- Garland, K., 1994, *Mr. Beck’s Underground Map: A History*, Harrow Weald, Middlesex: Capital Transport Publishing.
- Hadlaw, J., 2003, “The London Underground Map: Imagining Modern Time and Space”, *Design Issues*, vol. 19, No. 1, Winter 2003, pp. 25 – 35.
- Mellonie, D., 2011, What's in a name? Design Institute of Australia. <http://www.dia.org.au/index.cfm?article=1499&id=102>. Web page accessed May 1 2013.
- Ovenden, M, 2005, *Metro maps of the world*, Harrow Weald, Middlesex: Capital Transport Publishing.
- Roberts, 2005, *Underground Maps After Beck*, Harrow: Capital Transport Publishing
- Tufte, E., 2002, London Underground maps (+ worldwide subway maps) Blog http://www.edwardtufte.com/bboard/q-and-a-fetch-msg?msg_id=00005W. January 11, 2002.